

Figure 1A

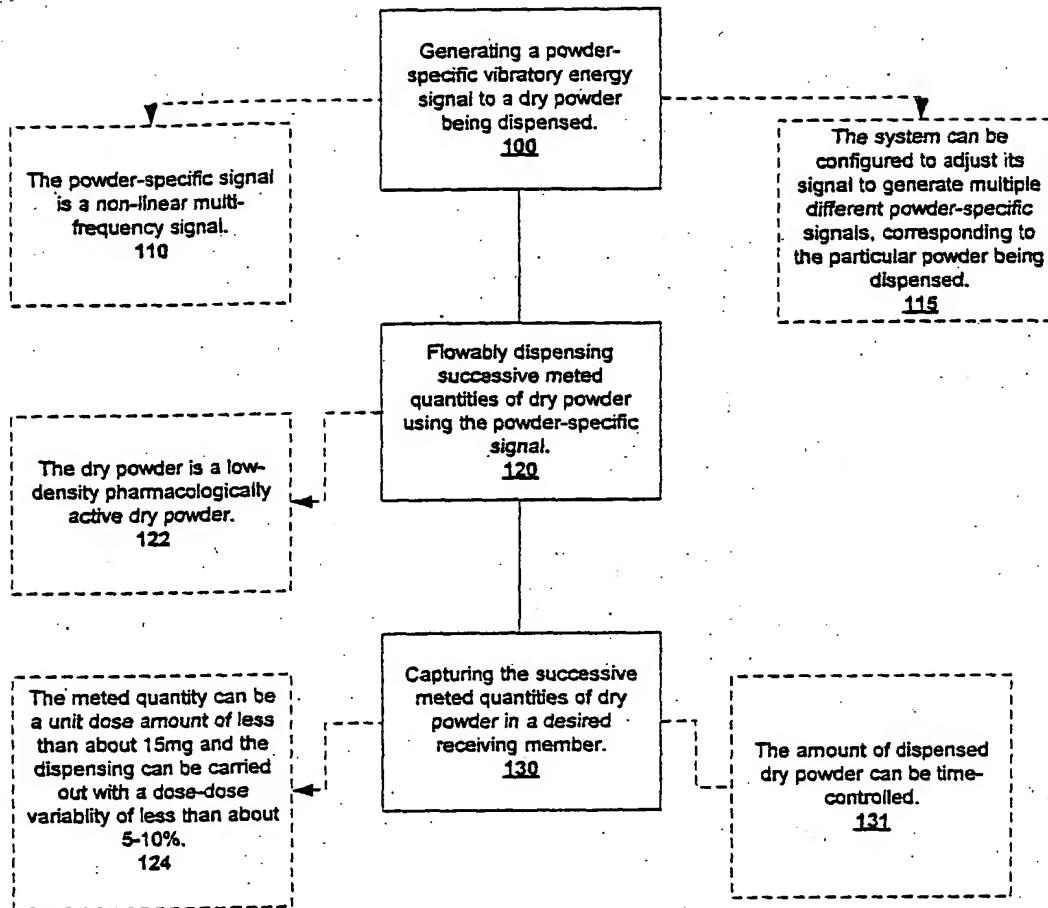


FIGURE 1B

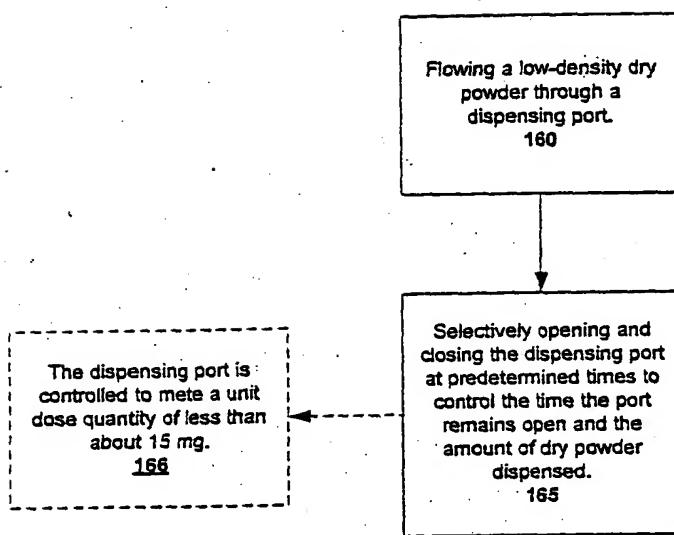
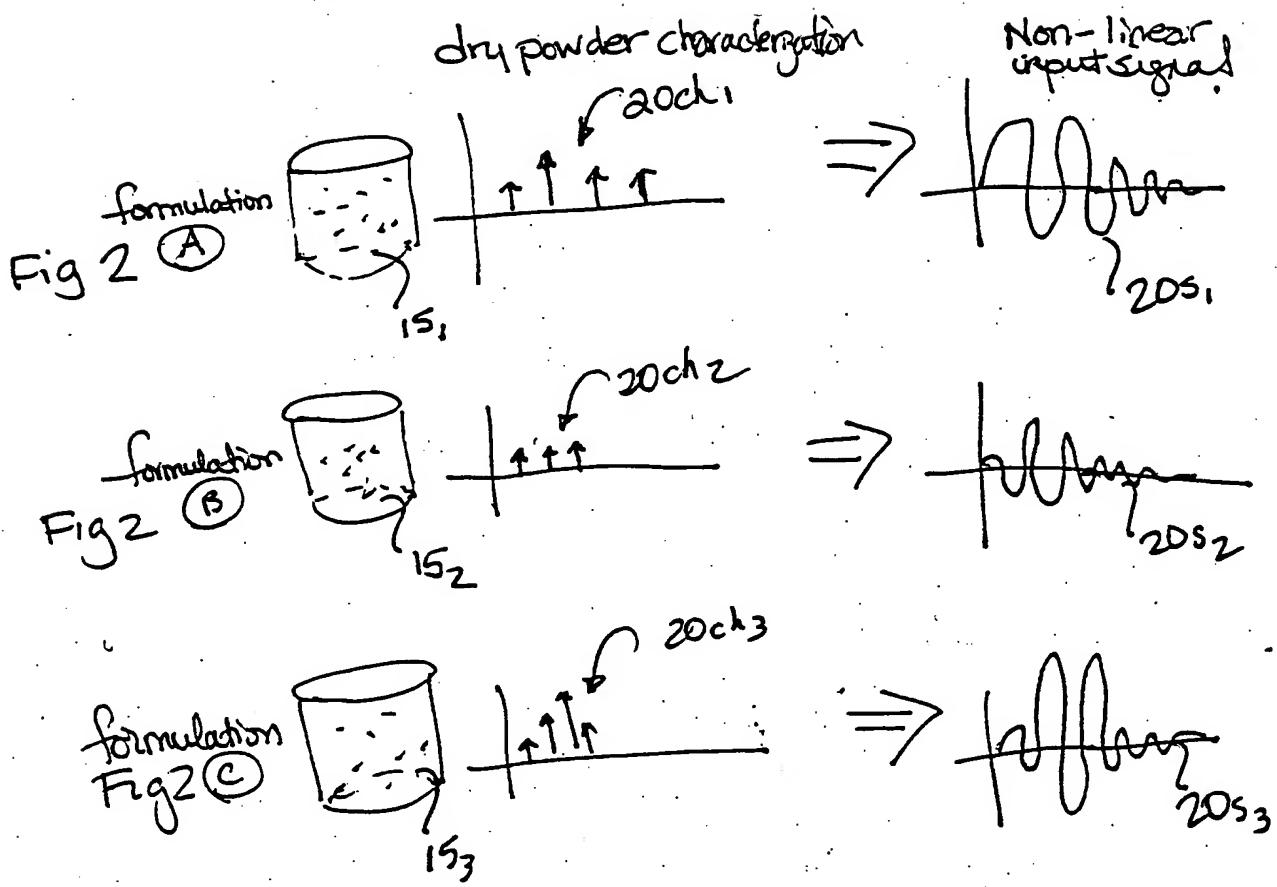


FIGURE 1C



SIGNAL GENERATION ALGORITHMS

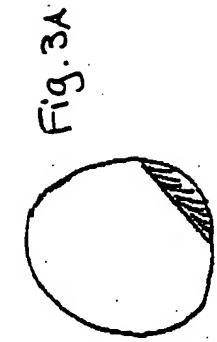
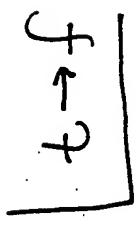


Fig. 3A

Measure time between
markings for
panders in
rotating drum

Fig. 3B



convert time
to frequency
space

Fig. 3C



plot distribution
of frequencies

Fig. 3D



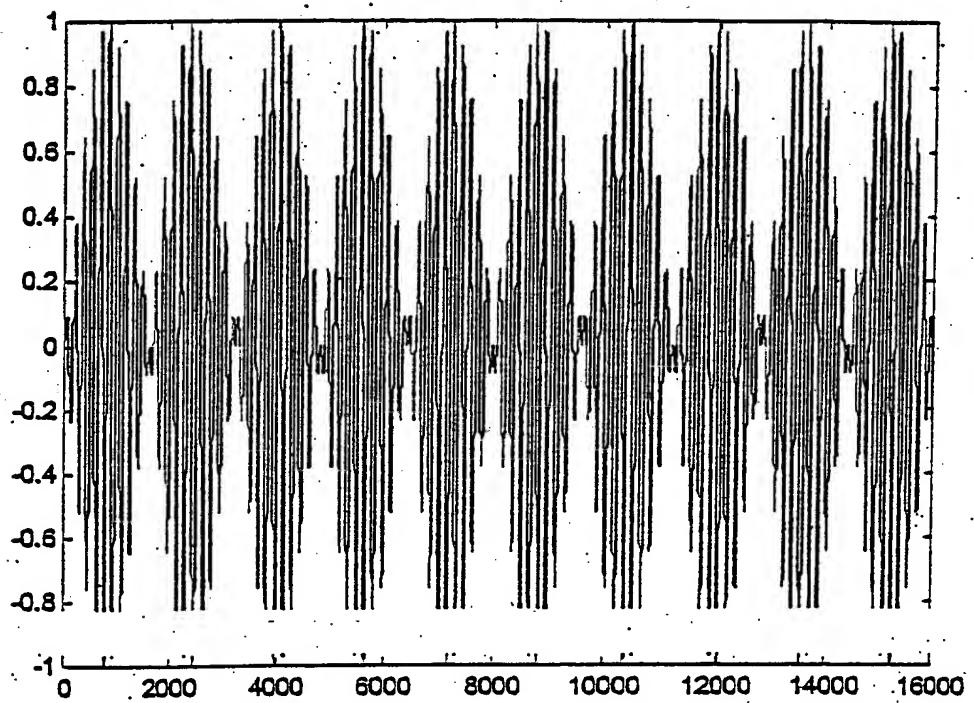
Fig. 3E

Record top six most
observed frequencies,
typically representing
75% of distribution

superimpose these six
frequencies to construct

a single superposition
signal (can include
step of adjusting relative
amplitudes)

FIGURE 14



6

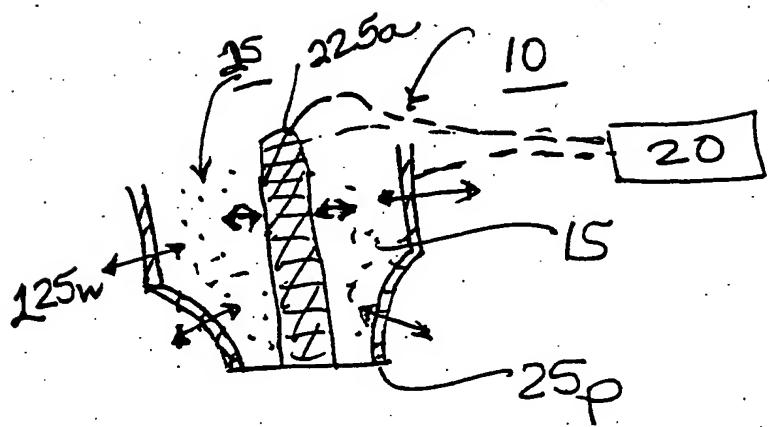


Fig. 5A

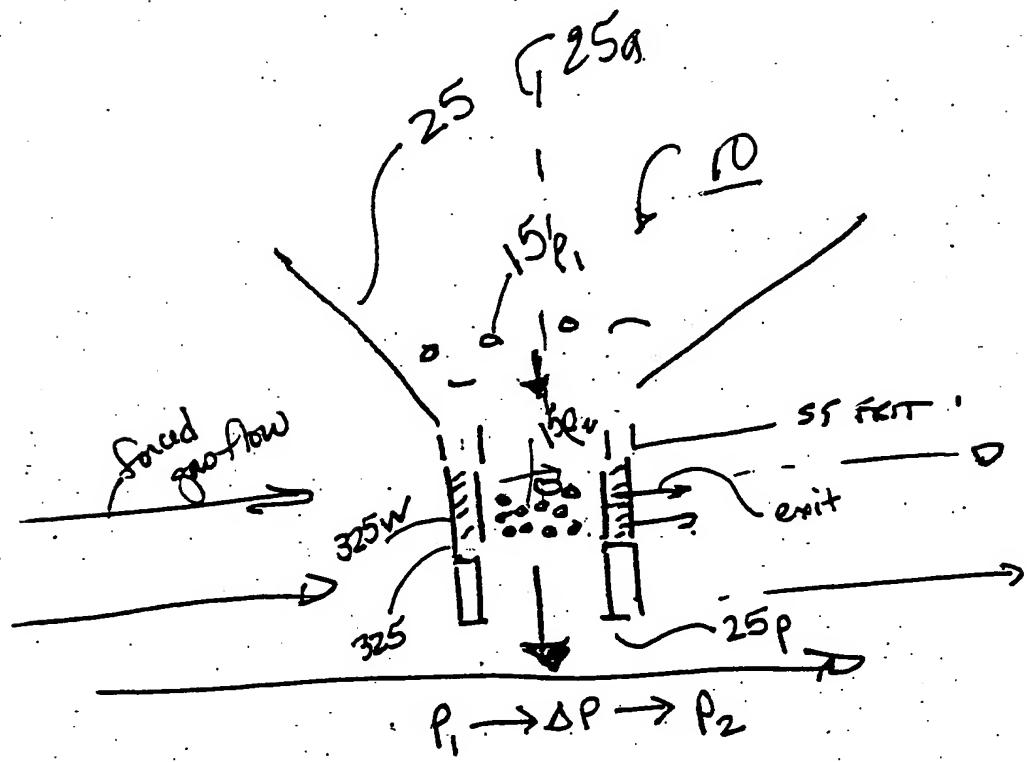


Fig. 5B

NON-LINEAR VIBRATION / CENTRIFUGATION PRINCIPLE OF POWDER FILLING.

Basic Principle:

COMBINE NON-LINEAR FUNCTION
WITH CENTRIFUGAL MOTION

THIS CAN BE ADAPTED
TO LOCAL NON-LINEAR
VIBRATION.

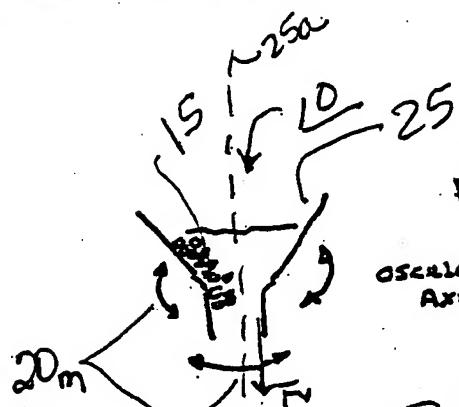


Fig. 6

OSCILLATE ON
AXIS.

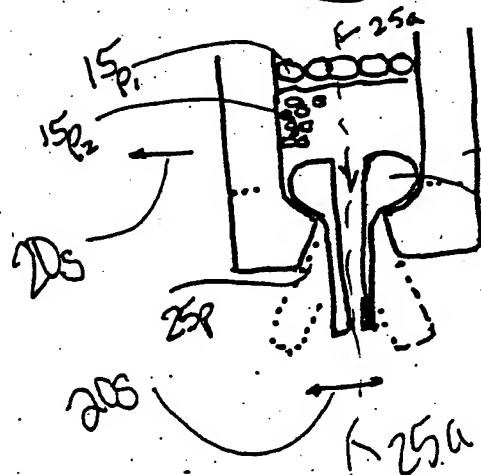


Fig. 7

VIBRATE
HEAD

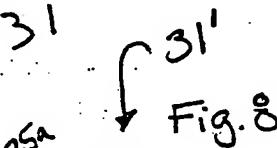


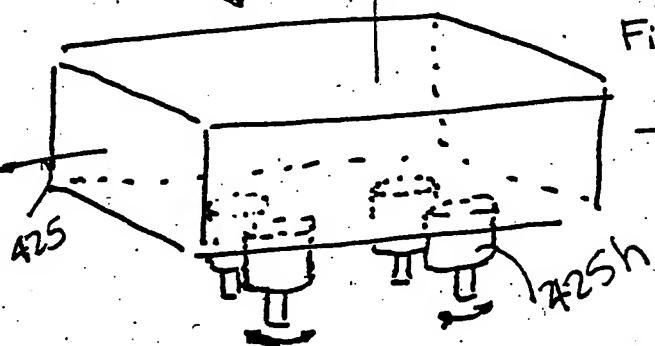
Fig. 8

DIAGRAM OF
OSCILLATING
INSERT.



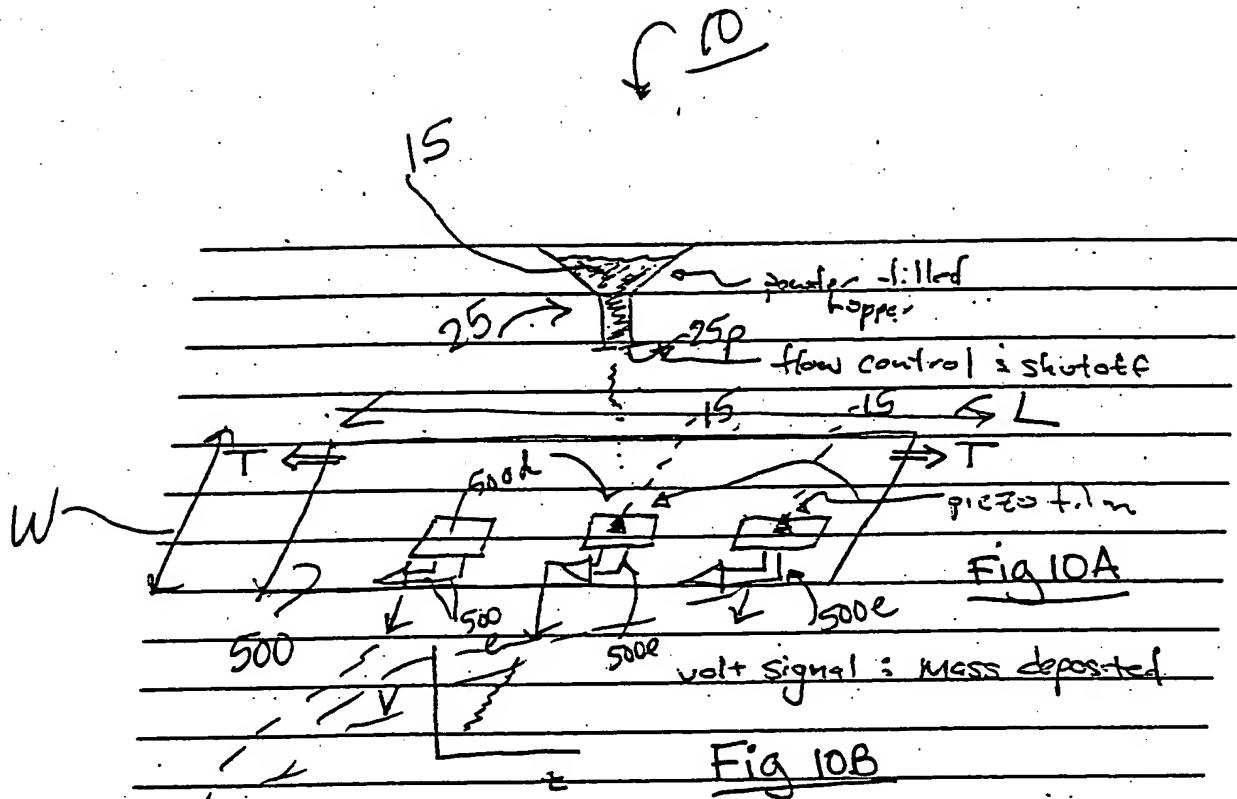
Fig. 9

VIBRATION CAN BE
APPLIED TO A
RACK OF HEADS FILLING
FROM SINGLE HOPPER.



VIBRATE
RACK.

RADIUS (OR EXTREMES) OF MOTION CAN BE VERY SMALL. AT HIGH FREQUENCY
THE ANGULAR VELOCITY WILL BE SUFFICIENT TO GIVE DIRECTIONAL
ACCELERATION TO PARTICLES.



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Detection
System

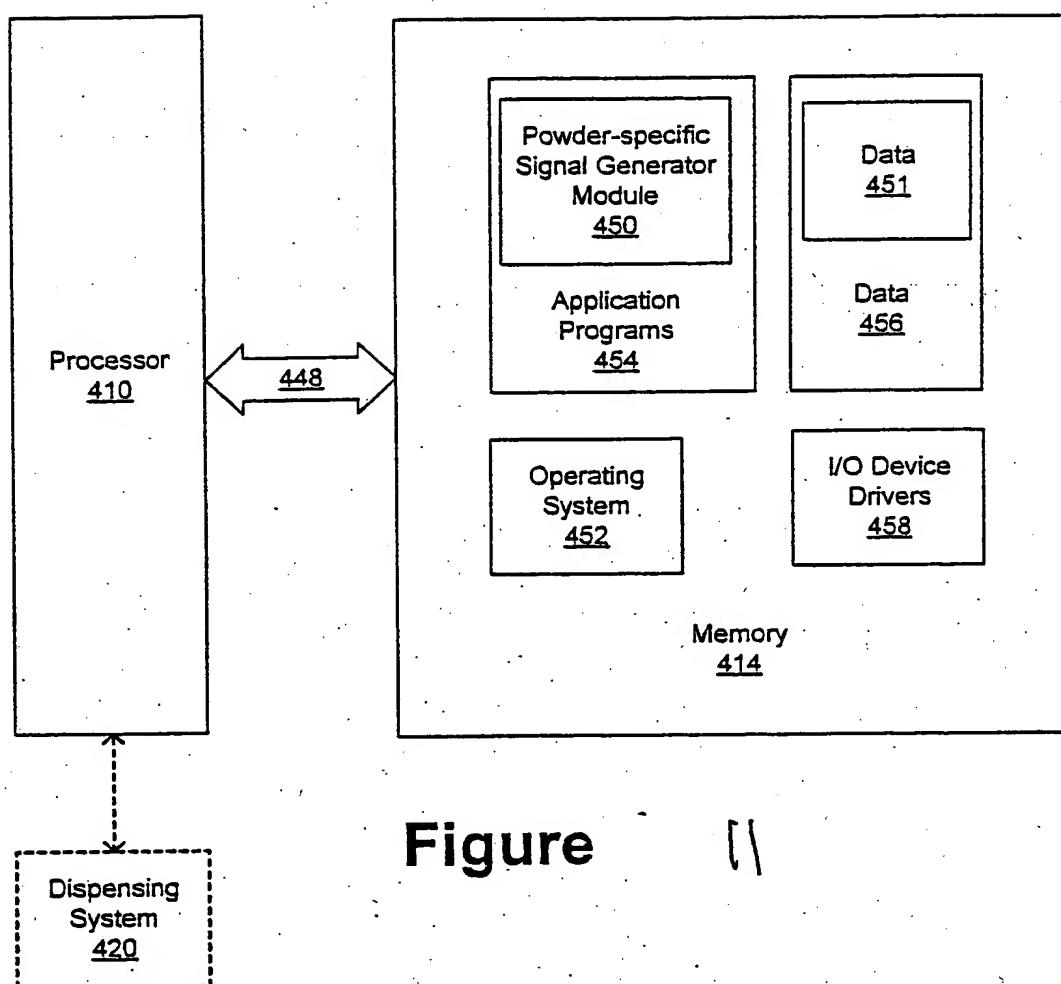


Figure 11

FIGURE 12

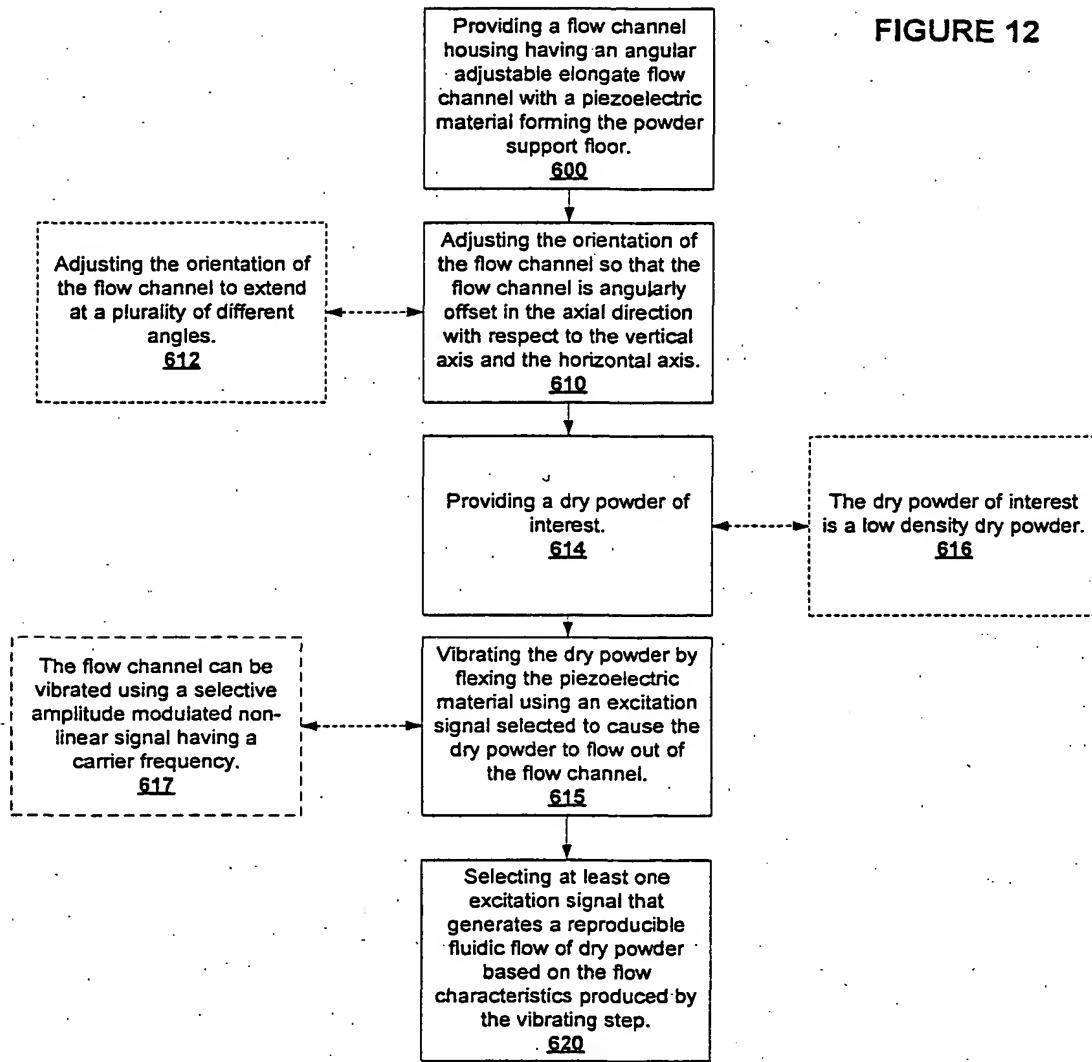
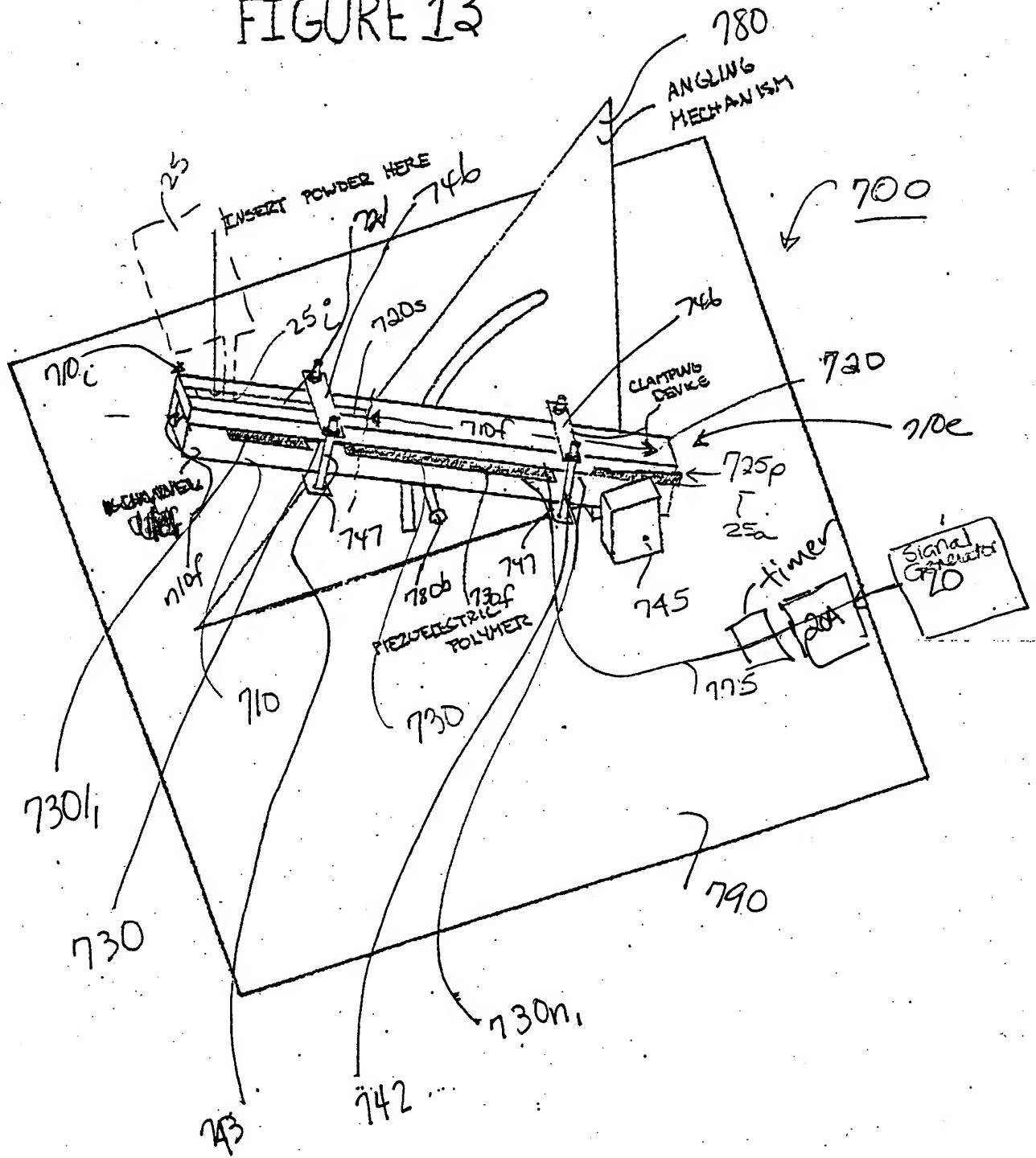
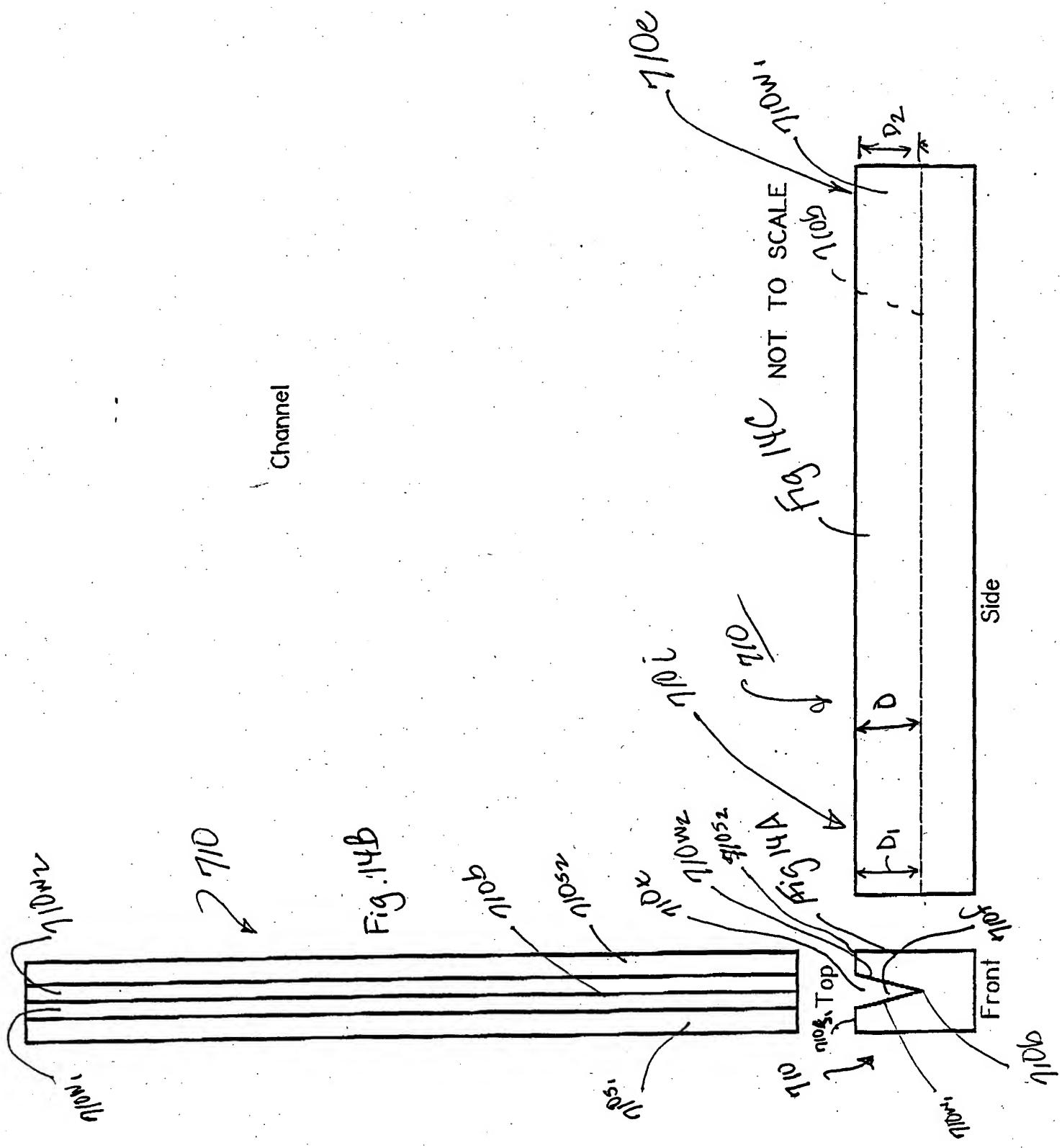
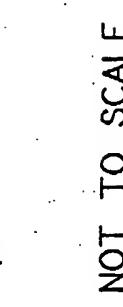
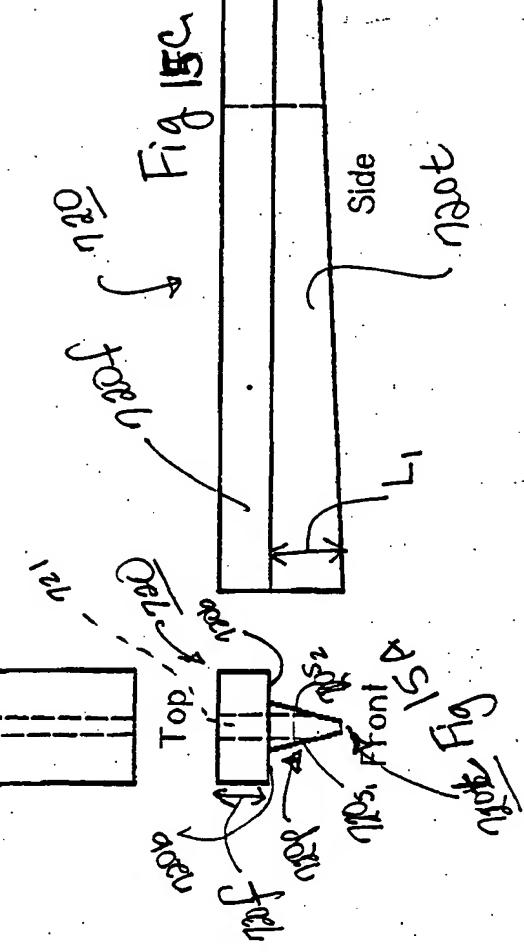
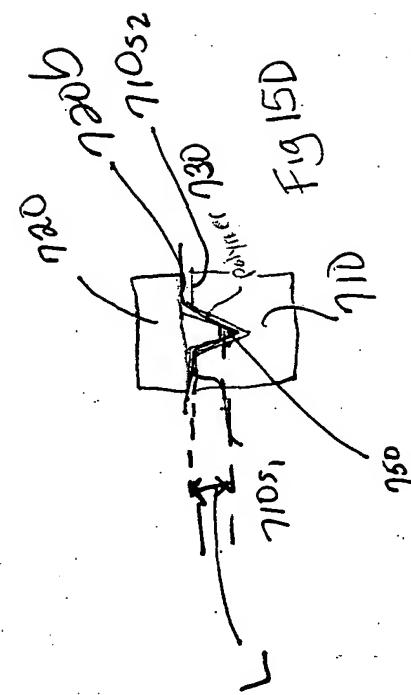
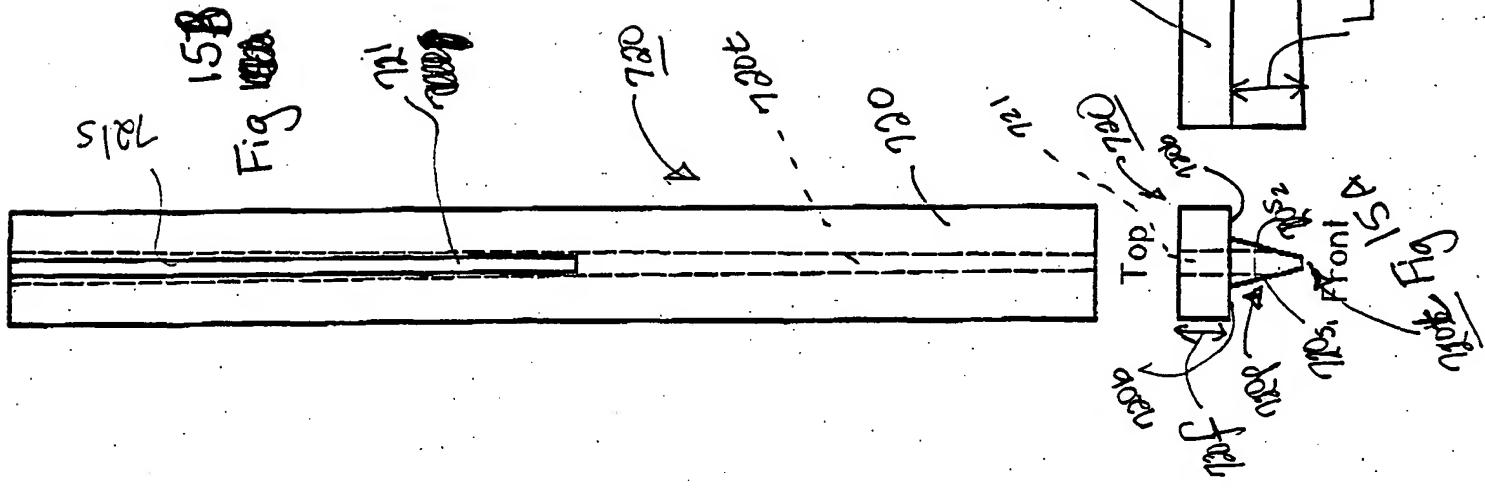


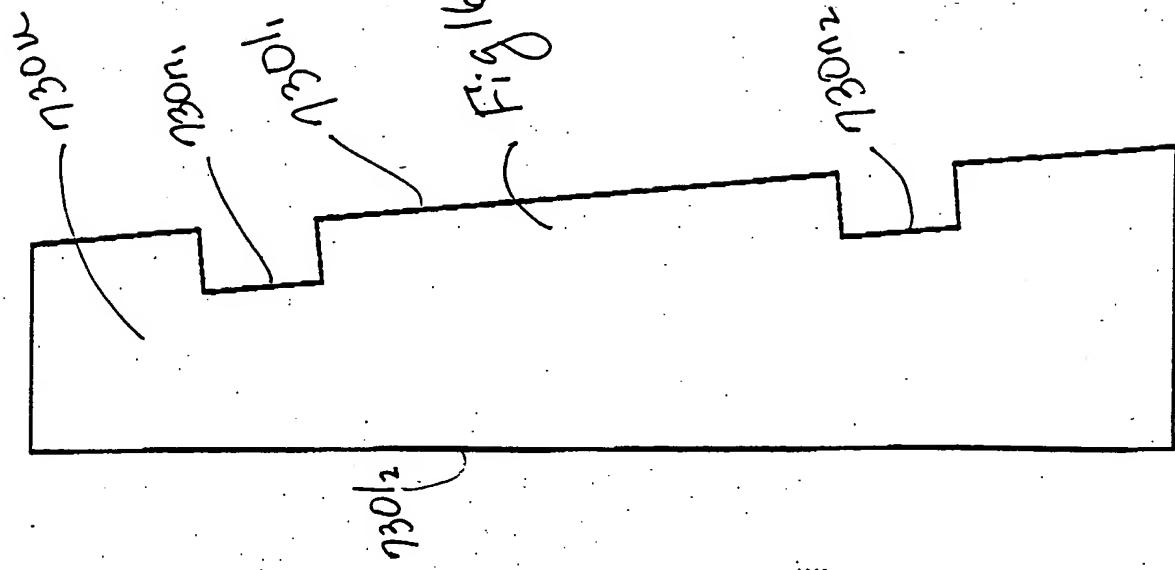
FIGURE 13







Part 3: Piezoelectric Polymer
NOT TO SCALE



NOT TO SCALE

~~144, 047~~



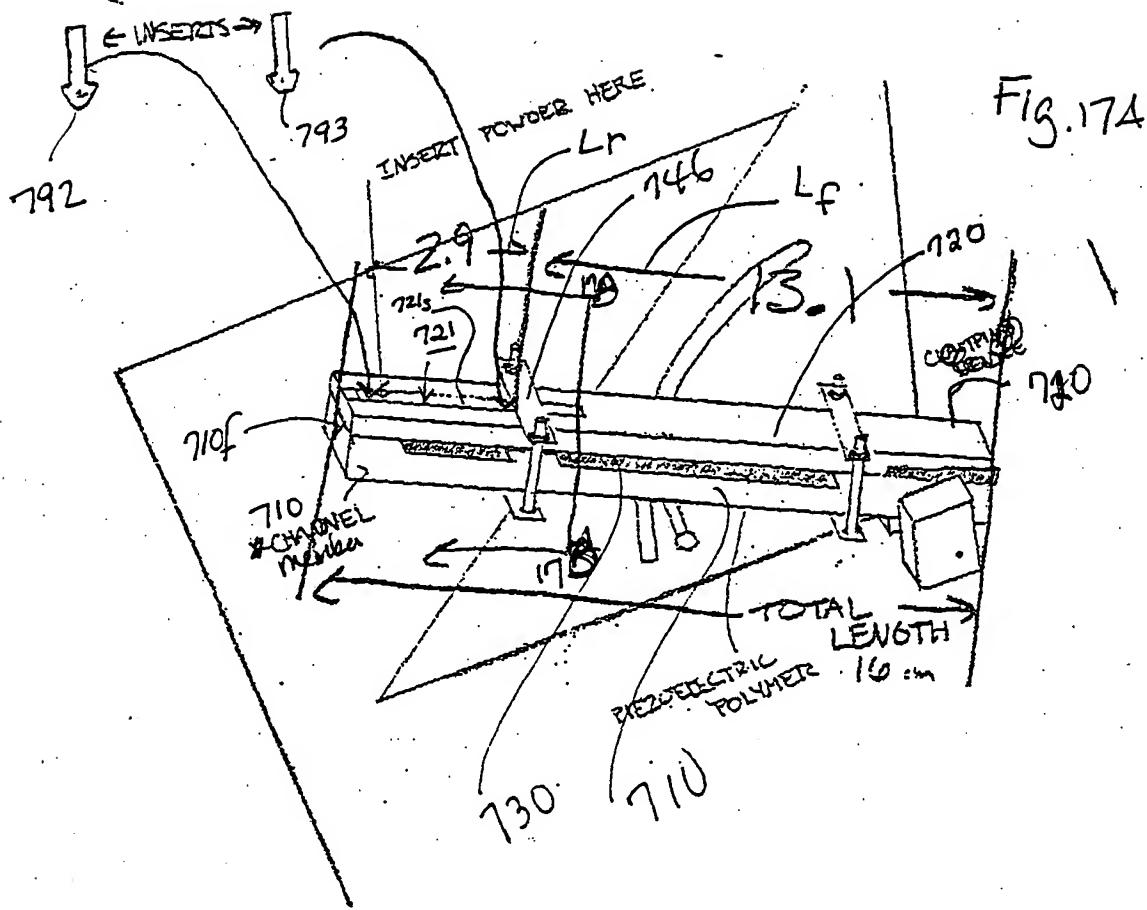


Fig. 17B

